

Surgical management of carcinoma of eyelids and periorbital skin

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SUMMARY An appraisal of a personal series of 115 unselected and surgically treated cutaneous cancers of palpebral region is presented. Histological confirmation of the diagnosis and adequacy of excision was obtained for all lesions. Seven of the 8 patients with doubtful clearance were successfully treated with further surgery very soon. Complications were few, the incidence of re-operations low, and cosmetic as well as functional results were mostly satisfactory. Tumour recurred in 1 case (0·87%). Two patients had a poor cosmetic result. Seventy-nine cases (69%) were treated as day cases under local anaesthesia even for major repairs like full-thickness reconstruction of two-thirds of the lower eyelid and repairs with large full-thickness skin grafts of up to 20×55 mm by a new simple technique of graft fixation. The use of longer-acting local anaesthetics in oculoplastic surgery is described. Attention is drawn to the dangers of using direct wound closure for repair.

Apart from the readily observable cosmetic blemish that they produce malignant tumours of the skin of the eyelids and periorbital differ from cutaneous malignancies elsewhere by their tendency to damage the ocular and adnexal structures either by direct invasion or as a consequence of therapy. Whatever the method employed to treat such lesions, the objectives should therefore be the eradication of the tumour in toto, without any damage or potentiality of damage to the structure and function of the eye and its adnexa, and the ultimate attainment of a normal or near normal functional and cosmetic result. Only rarely is it impossible to achieve such desirable results by primary surgery in experienced hands. The aim of this communication is to analyse the clinical features and results of 115 epithelial carcinomata surgically treated by the author personally in an ophthalmic unit.

Patients and methods

One hundred and forty-three unselected patients with 154 malignant or suspected malignant lesions of the eyelids and periorbital were treated by excision and surgical repair in the author's unit between January 1969 and December 1977. Of these 6 were recurrences following primary treatment elsewhere—

2 by radiotherapy and 4 by surgery, including a rodent ulcer that was curetted elsewhere, having been mistaken for a meibomian cyst. All excised lesions were examined histologically for confirmation of diagnosis and completeness of excision. Those patients reported as having inadequate or doubtful clearance were soon operated on again to obtain histological confirmation of the adequacy of tumour excision.

Eight such patients have not been included in the statistics of recurrence. During these 9 years 1 patient was referred from the unit for primary radiotherapy. The patient was averse to surgery and had basal cell carcinoma on the side of the nose extending to the lacrimal sac region. During the same period 7 patients with rodent ulcers of the eyelids were referred by radiotherapists to the unit for primary surgery. The remaining patients were referred by general practitioners, dermatologists, ENT surgeons, and ophthalmic and general surgical colleagues.

Of the 154 lesions treated surgically in this series 115 were malignant tumours—109 basal cell carcinomata, 4 squamous cell neoplasms, 1 melanoma, and 1 Bowen's disease. To simplify statistical analysis each multiple lesion in the same patient has been counted as an additional case. Detailed analysis of only the 109 basal cell lesions has been done, as the incidence of other tumours was very small. The incidence of rodent ulcers was slightly

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more in males (58 cases) than in females (51 cases). The youngest patient was 31 years old, and the oldest was 93. The age distribution is shown in Table 1.

The topographical distribution of the tumour is depicted in Table 2. The lower eyelid was the commonest site affected. The eyelid margin was involved in 40 cases. Lesions situated medial to the lacrimal punctum, or on the eyelid but extending medial to the punctum, have for statistical purposes been accepted as inner canthus lesions. Similarly, any lesion situated on the upper or lower eyelid but extending to the external canthus has been classified as a lateral canthus lesion.

As the size of the tumour was not recorded in all cases, the magnitude of excision—taken as the maximum dimension reported as 'macroscopic appearance' in the histopathology reports—is summarised in Table 3. The smallest excision was 9×10 mm, and the largest was 20×55 mm. Except for 5 patients who are lost to follow-up and 29 who have died of unrelated conditions, all patients continue to have regular follow-up. The maximum follow-up period has been 9 years and

Table 3 *Magnitude of tumour excision (longest diameter) (smallest excision 9 mm, largest excision 55 mm)*

Excision in mm	Number of cases
8–10	7
11–15	26
16–20	58
Over 20	18
Total	109

the minimum 11 months. A follow-up of 18 months or more was achieved in 93.2% of the patients (average 3.7 years).

SURGICAL MANAGEMENT

Except for a few lesions in the earliest part of the series all tumours were excised with at least 4 mm clinical clearance. Following the precept of Whiting (1951) in judging the clearance, the visual as well as the tactile impression with ungloved fingers was utilised. With progressive surgical experience the excisions have tended to be increasingly liberal. Pre-excisional biopsy was carried out only on those patients in whom suspiciously malignant-looking lesions were situated at or near the eyelid margins. In such cases wider excision and full-thickness eyelid repair were carried out only if the histology proved the lesion to be malignant. A frozen-section report was obtained in only 1 patient, who had an extensive rodent ulcer at the inner canthus involving the upper and lower eyelids. It confirmed the clinical suspicion of invasion of the bulbar conjunctiva, thereby facilitating the decision to carry out enucleation and 'hemixenteration' (see below).

ANAESTHESIA AND GENERAL MANAGEMENT

General anaesthesia was used for the first 31 cases of this series. These patients were admitted to the hospital. The remaining 84 patients with malignant lesions (and 39 patients with suspected malignant lesions) received local anaesthesia and were treated as day cases, except for 5 patients who were admitted to the hospital for social reasons. As the local anaesthetic effect of lignocaine tended to wear off in about an hour or so, all patients except the initial few operated upon under local anaesthesia received local infiltration of 2 ml bupivacaine 0.5% with adrenaline (Marcain). Those patients requiring full-thickness eyelid reconstruction were in addition given *retrobulbar injection* of 2 ml Marcain, and a *facial nerve block* also with 2 ml Marcain. The donor site for obtaining full-thickness skin graft (and that for a mucous membrane graft if necessary) was also infiltrated with 2 to 4 ml Marcain. The

Table 1 *Age of the patients at initial excision of the rodent ulcer (the youngest patient was 31 and the oldest 93)*

Age in years	Number of patients
Under 31	Nil
31–	3
41–	4
51–	25
61–	42
71–	29
81–	4
91–100	2
Total	109

Average age 65.6 years

Table 2 *Topographical distribution of the rodent ulcers (40/109 tumours involved lid margins)*

Location of tumour	Number of cases
Lower eyelid	59
Inner canthus	28
Upper eyelid	13
Outer canthus	9
Total	109

Table 4 Surgical procedures used for 115 cases of cutaneous malignancies in the peripalpebral region

Site of lesion	Method of repair	Number of cases
1. Lesions not involving eyelid margin; situated more than 5 mm from the margin; situated on upper or lower eyelid, or at nasocanthal angle	(i) Full-thickness skin graft. Technique in most cases (Mehta, 1977, 1978), Fig. 1	71
	(ii) Pedicle flap from the adjacent upper eyelid skin	2
2. Lesions involving full-thickness lower eyelid or situated within 5 mm of its margin	(i) Full-thickness skin graft with simultaneous free mucosal graft (Mehta, 1977)	17
	(ii) Free mucosal graft with local rotational flap or canthoplasty (Mustardé, 1966)	13
	(iii) Tarsoconjunctival flap from upper eyelid (Holström <i>et al.</i> , 1975; Hewes <i>et al.</i> , 1976) with simultaneous full-thickness skin graft by the author's technique	4
3. Lesion involving full-thickness upper eyelid or situated within 5 mm of its margin	(i) Full-thickness rotational flap from lower eyelid (Mustardé, 1966). Later reconstruction of the lower eyelid as in 2 (i) above	3
4. Miscellaneous—especially lesions at inner canthus	(i) Wide excision allowing repair by spontaneous granulation (Beard and Fox, 1964)	4
	(ii) Enucleation and 'hemixenteration', Fig. 5	1
Total		115

prolonged local anaesthetic effect of a single infiltration with bupivacaine made it possible to perform extensive procedures like subtotal full-thickness reconstruction of eyelids (lasting for 3½ hours) without any additional infiltration. All patients were allowed full activity immediately after the operation. The day cases were seen for first dressing at 48 hours and then between the 7th and 10th postoperative day for removal of sutures. All patients were given 2 co-trimoxazole (Septrin) tablets twice daily for 5 days.

The surgical techniques used to treat the lesions are summarised in Table 4.

Results and comments

Of the 154 lesions submitted for histology a *definite* clinical diagnosis of malignancy was made in 139 lesions and a *tentative* diagnosis in 15 lesions. Histology confirmed malignancy in 114/139 (82%) and 1/15 (6.7%) respectively. In 8 cases histology reports suggested incomplete or doubtful clearance. Seven of these 8 cases were therefore soon subjected to further wide excision. None of the resubmitted specimen showed tumour remnants. It was therefore decided to observe the 8th patient without undertaking further surgery. No clinical evidence of tumour persistence or recurrence has been found in an 18 months follow-up of this patient.

There has been 1 true recurrence (0.87%) of a lower eyelid rodent ulcer that was initially situated 3 mm from the eyelid margin. Histology of the first

specimen did confirm complete excision, but 10 months later there was a clinical recurrence, which needed a wide full-thickness excision and repair. The histology of the second specimen confirmed complete clearance. No further recurrence has been found in a 4-year follow-up of this patient. In retrospect, full-thickness excision of the eyelid—because of the proximity of the lesion to the lid margin—should have been carried out at the first operation.

One patient with histologically confirmed complete excision of a rodent ulcer at the inner canthus was clinically suspected of having a recurrence 14 months later. The histology of the second wider excision showed the tumour to be a neurofibroma under the skin graft. One case of multicentric erosive basal cell epithelioma had histological confirmation of adequacy of excision at *each* of the 2 operations. At his last check-up in the unit 2 years ago there was a clinical suspicion of persistence of the tumour. The patient is now being followed-up elsewhere, and the clinicians there do not think there is a recurrence.

There is 1 case of 'permanent failure' in a patient with a deep penetrating rodent ulcer that was already present for 7 years when the patient was first seen. At the time of first wide excision of three-quarters of the lower eyelid in full-thickness the inferior oblique muscle was observed to have been infiltrated with the tumour. The infiltration has become progressively worse, resulting in fixity of the globe. The correct management here should have been exenteration, but the patient refused. Primary enucleation

and 'hemixenteration' (see below) were carried out in 1 patient in whom frozen section confirmed the clinical suspicion of bulbar conjunctiva invasion by a rodent ulcer at the inner canthus. This lesion was already present for 6 years before the patient was first seen. There has been no death due to the tumour in any patient of this series, but 29 patients have died from unrelated conditions during the 9 years of this series. Five patients have been lost to follow-up. The clinical records of these 34 patients show no evidence of tumour recurrence at their last visit.

In the great majority of cases the cosmetic results were gratifying. Skin grafts had merged imperceptibly into the surrounding tissues as regards colour, texture, surface, and suppleness. The eyelids appeared symmetrical, and had normal mobility, providing normal corneal coverage.

COMPLICATIONS

Considering the fact that most of the patients in the series had major reconstructive surgery the incidence of complications was low. No patient had temporary or permanent visual impairment due to the surgery, and apart from the planned enucleation (and hemixenteration) in 1 case no eyes were lost. None of the patients needed major surgery to combat any of the complications, which were as follows:

Epiphora. This occurred in 11 cases (10%) and varied from tolerable in 9 cases, to annoying in 2 cases. In all the cases the epiphora was due to planned surgical excision that included the lacrimal passages. No patient has needed further surgery for reconstruction of the lacrimal passages.

Trichiasis. It occurred in 4 cases (3.5%) and has been successfully treated with electrolysis.

Minor cosmetic blemishes occurred in 6 patients (5.2 per cent). Three patients had slight ectropion of the lower eyelid. Two had rounding of external canthus, and 1 had mild ptosis. None of these needed corrective surgery.

Healing of full-thickness skin graft by *fibrosis due to haematoma* under the graft occurred in 1 patient in whom the graft was secured by a tie-over bolus technique. Acceptable cosmesis has obviated the need for further surgery.

Poor cosmesis. This occurred in 2 cases (1.7%). Both patients were over 80 years old. One had poor colour match of a full-thickness skin graft after reconstruction of three-quarters of lower eyelid in full thickness by simultaneous buccal mucosal and skin graft. There is sagging of eyelid margin. The second patient had ectropion of the lateral half of lower eyelid. Neither patient opted for further cosmetic surgery.

Complications pertaining to skin graft *donor sites:* (i) One patient needed resuturing of a retroauricular

wound that gaped on the 6th day. This patient had a previous history of wound gaping in the scapular region. (ii) One patient had prolonged non-healing of an inner arm donor site for 10 weeks after removal of a 30×60 mm skin graft. The wound has healed by granulation leaving a prominent symptom-free scar. (iii) Temporary difficulty in wearing spectacles for 3 weeks due to tenderness of retroauricular wound occurred in 3 patients.

Discussion

The sine qua non for successful surgery of cutaneous cancers of eyelids is wide excision of the tumour followed by adequate repair of the defect so created. Some of the operations designed to repair these defects are extremely complicated procedures beyond the capacity of most ophthalmologists. The following few relatively simple techniques suitable for adoption by ophthalmic surgeons have therefore been selected for discussion. Some of these techniques have been evolved by the author.

DIRECT WOUND SUTURING

The requisite of wide clearance to ensure success creates a defect so large—even for average lesions—that for a properly excised lesion there is seldom any possibility of repair by direct suturing without risking distortion. Any attempt at minimising the size of the wound to avoid a 'major' repair is likely to lead to an inadequate excision, with increased chances of recurrence of the tumour.

Direct suturing of the wound was not carried out in any of the 115 patients in this series. It is believed that this accounts for the low incidence of recurrence (0.87%) and the low incidence of complications and their relatively minor nature.

FULL-THICKNESS SKIN GRAFTING

This is a very useful procedure for repairing extra-marginal wounds as well as achieving full-thickness lower eyelid reconstructions, where it is used in conjunction with a free mucosal graft (Mehta, 1977) or with tarsoconjunctival flaps (Holmström *et al.*, 1975; Hewes *et al.*, 1976). Full-thickness skin grafting is therefore a versatile technique capable of being used for the vast majority of palpebral and peripalpebral tumours. In the present series it was used in 93 out of 115 cases (81%). Of these, 22 were lesions necessitating full-thickness eyelid reconstructions.

The conventional method of securing a full-thickness skin graft by a 'tie-over' bolus has disadvantages, especially of having to restrict the activity of the patients for a few days after the operation. The patients are therefore admitted to

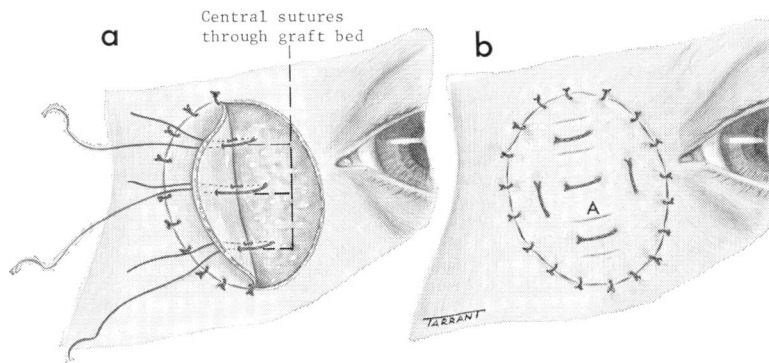
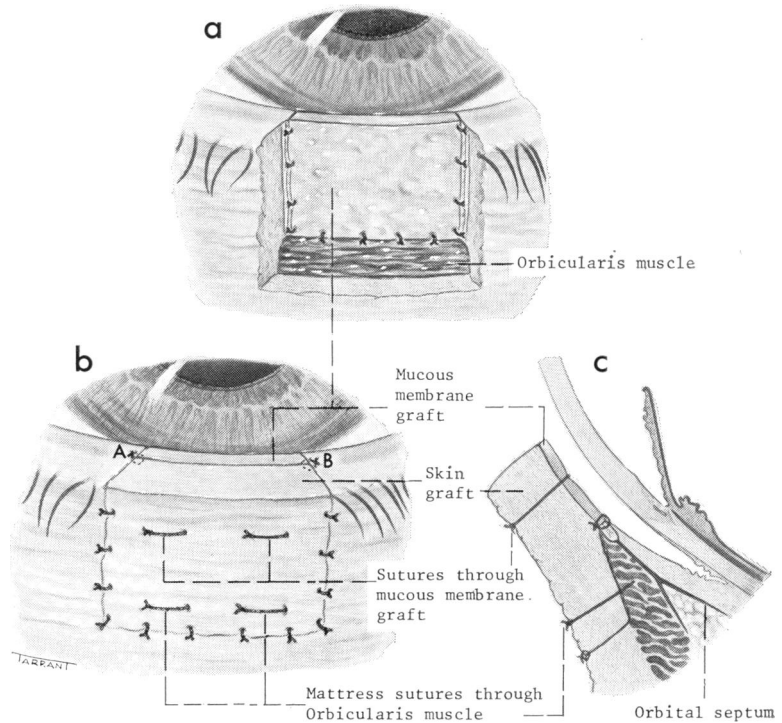


Fig. 1 Author's technique of full-thickness skin graft fixation. One long edge of the graft is sutured with interrupted marginal sutures of 5-0 polyglycolic acid (Dexon), placed 2 or 3 mm apart. Central and paracentral sutures are now passed between the graft and the depth of the recipient bed. These mattress sutures are tied under moderate tension only after the remaining marginal sutures have been introduced and tied. A tie-over bolus is not necessary. The patients can resume unlimited

activity immediately after the operation, as the central sutures will prevent the graft from being lifted off its bed

Fig. 2 Author's technique of full-thickness reconstruction of lower eyelid with simultaneous free mucosal and free full-thickness skin grafts. (a) The mucosal graft (nasal septal or buccal) is first sutured to the remaining tarsoconjunctival layer with interrupted marginal 5-0 Dexon sutures with knots tied on the superficial (cutaneous) aspect. The free skin graft is placed over the sutured mucosal graft, and interrupted marginal cutocutaneous (skin graft edge to recipient skin edge) and central cutomucosal mattress sutures, and cutomuscular (skin graft to depth of orbicularis muscle) are introduced and tied as shown in (b) and (c). Intermarginal sutures between the upper and lower lids may be passed



hospital. Fox (1976) advocates that the patient be kept in bed for 24 hours, and then allowed only bathroom privileges for the next 48 hours. For a large graft whose take may seem precarious Fox imposes even more stringent restrictions. During the past few years a new technique has been devised (Mehta, 1977, 1979) for full-thickness skin graft fixation, Fig. 1. Over 130 patients have received full-thickness skin grafts secured by this technique. All but 5 of these have been treated as day cases. The largest full-thickness skin graft in the series was

20×55 mm. The retroauricular skin is used for small grafts and inner arm skin for grafts larger than 20 mm.

In the full-thickness lower eyelid reconstruction with simultaneous full-thickness skin graft and free buccal mucosa graft (Fig. 2), between the first and third postoperative weeks, the mucosal graft may appear soft, white, and crinkled. This could be alarming both to the patient and to the clinician. But the graft soon resumes normal appearances and the new eyelid margin regains progressive normality

in about 8 weeks (Fig. 3). Of the 17 full-thickness lower eyelid reconstructions by the author's method only 1 patient had sagging of the eyelid margin and poor colour match. This was 1 of the 2 patients reported as having had poor cosmesis in this series. For reconstruction of lateral half of the lower eyelid in full-thickness very satisfactory results have been obtained combining the technique of Hewes *et al.* (1976) of tarsoconjunctival rotation with a full-thickness skin graft secured by the author's technique (Fig. 4).

Except for patients who have a tendency to form keloids, there are no contraindications to repair by this technique of skin grafting.

ROTATIONAL PEDICLE FLAP OF FULL-THICKNESS LOWER LID

Mustardé (1966) initiated this excellent technique of reconstructing a full-thickness defect of the upper

eyelid. The pedicle is divided in about 2 weeks, when the defect in the lower eyelid is made good.

The results are very satisfying and there are no contraindications for full-thickness upper eyelid reconstruction by this method. Its minor disadvantages are the visual obstruction by the pedicle for 2 weeks and that it needs a second-stage reconstruction of the lower eyelid.

EXENTERATION OR 'HEMIEXENTERATION'

The only patient who needed exenteration in this series has consistently refused it and has been recorded as being a case of 'persistent tumour failure'.

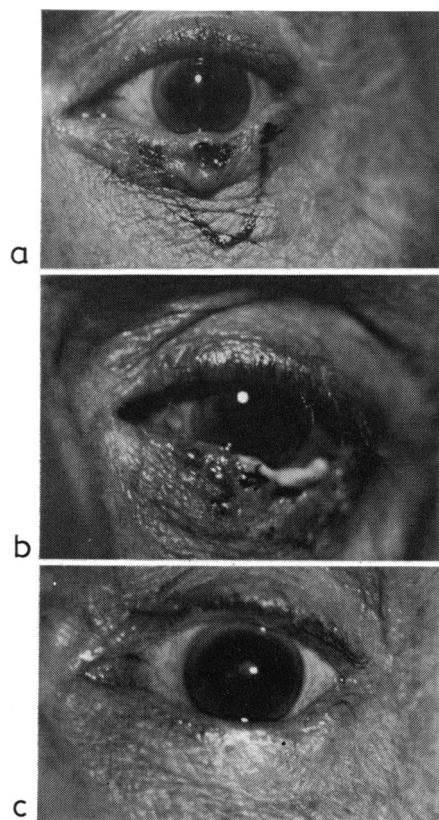


Fig. 3 Result of full-thickness reconstruction of lower eyelid by technique described in Fig. 2. (a) Preoperative appearance of basal cell epithelioma involving eyelid margin. (b) Appearance 3 weeks after repair showing healthy skin graft, but soft, white, and crinkled mucosal graft. (c) Normal appearance 3 months later

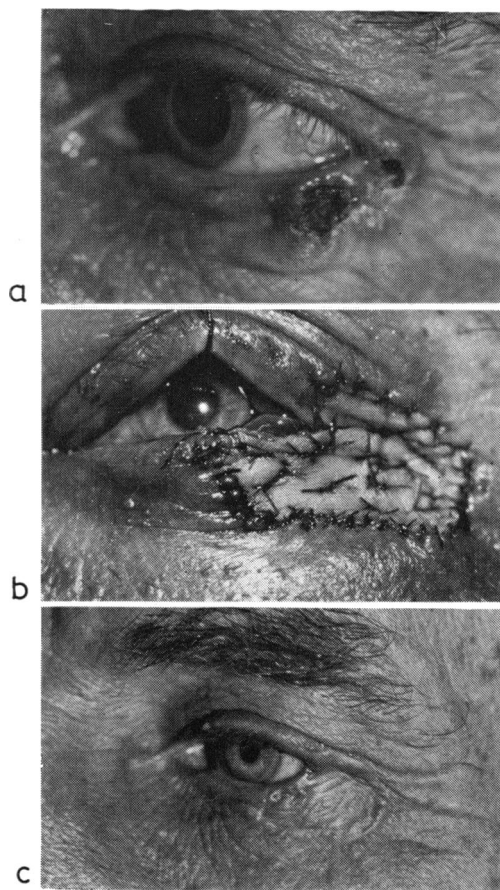


Fig. 4 Rodent ulcer at the outer canthus. Wide excision included full-thickness lateral half of lower eyelid. Defect made good by tarsoconjunctival transposition from lateral half of upper eyelid, and full-thickness skin graft from inner arm secured by the author's technique shown in Fig. 2. Surgery performed under local anaesthesia as a day case, with the patient resuming his normal work 24 hours after the operation. (a) Preoperative appearance. (b) Immediate postoperative appearance. (c) Appearance 6 months later

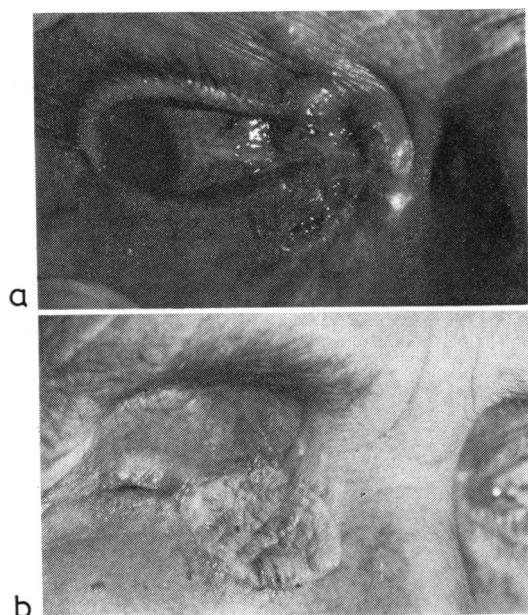


Fig. 5 Rodent ulcer at inner canthus present for 6 years. At the time of tumour excision clinical suspicion of invasion of bulbar conjunctiva was confirmed by frozen section. The eye was enucleated, and the contents of the medial half of the orbit were exenterated ('hemixenteration'). Wide excision included full thickness upper and lower eyelid, and medial half of orbicularis muscle. The defect was made good by a full-thickness skin graft secured by central and paracentral sutures to the remnants of conjunctiva, orbicularis, orbital rim, and eyelids. The surgical procedure lasted 4 hours and was performed under local anaesthesia. Originally the patient was scheduled to be treated as a day case, but it was decided to admit her for psychological reasons owing to the unscheduled enucleation carried out after the frozen-section report. (a) Preoperative appearance. (b) Appearance 3 months after 'hemixenteration'

One patient has been managed with 'hemixenteration'. The clinical suspicion of invasion of bulbar conjunctiva at the inner canthus was confirmed by a frozen section. The medial two-thirds of the upper eyelid and three-quarters of the lower eyelid were both excised in full thickness. The medial half of the orbicularis was excised, the eye was enucleated, and the contents of the *medial half* of the orbit were exenterated. The defect was made good by a full-thickness skin graft of 25×40 mm sutured to the remnants of conjunctiva, orbicularis, eyelids, and the orbital margins by the author's technique. The cosmetic result is very satisfactory (Fig. 5). There has been no recurrence during a 15-month follow-up.

REPAIR BY SPONTANEOUS GRANULATION

Four patients in this series were so managed—after

excision of lesions at nasocanthal angle in 2 patients and after excision of full-thickness medial two-fifths of lower eyelid in 2 patients. Three of these patients were elderly, frail, and had cerebrovascular insufficiency. The fourth patient had ugly facial features of gross rhinophyma and numerous other coarse blemishes of the face. Reconstruction of his lower eyelid would have meant merely an academic exercise, striving for perfection that would have looked out of place. The patient himself was delighted to have been offered the choice, and opted to have radical excision (of medial two-fifths of the lower eyelid in full-thickness) without any reconstruction (Fig. 6). The surgery lasted 10 minutes. The cosmetic results in this and other 2 patients

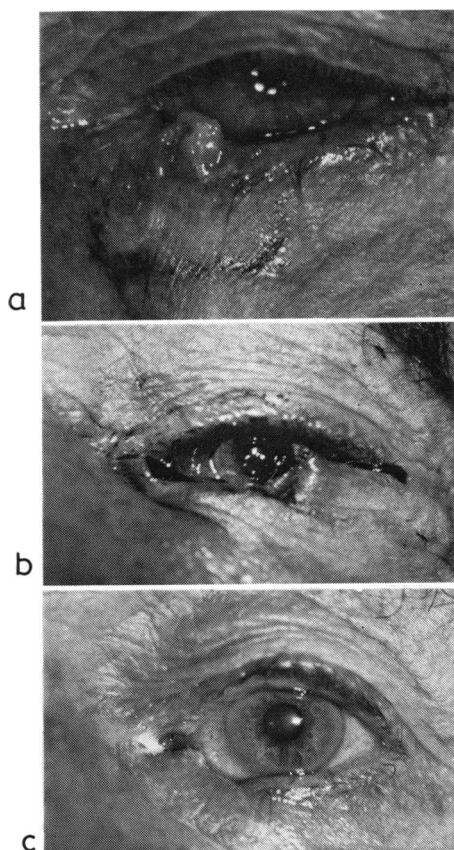


Fig. 6 Result of healing by spontaneous granulation of full-thickness excision of medial two-fifths of lower eyelid for rodent ulcer involving eyelid margin at inner canthus. The patient having been offered the choice between extensive reconstructive surgery and simple excision without any reconstruction or suturing of the wound opted for the latter procedure, which lasted about 10 minutes. (a) Preoperative appearance. (b) Immediate postoperative appearance. (c) Appearance 3 months later

were very good. In the fourth patient, who was aged 93, the cosmesis was tolerable. This method of management, first reported by Fox and Beard (1964), deserves wider acceptance in suitable cases as shown above.

The possibility of using the long-acting local anaesthetic Marcain for local infiltration as well as for retrobulbar and facial block (techniques familiar to all ophthalmologists) allows almost all palpebral cancers to be excised and repaired under local anaesthesia. The new technique of full-thickness skin graft fixation with central and paracentral sutures instead of a tie-over bolus allows patients full activity immediately after the operation, thus making it possible for them to be operated upon as day cases. Over two-thirds of the patients in this series (79 out of 115) were successfully treated as day cases, thus countering the main criticisms of surgery, namely, the cost of hospitalisation and the possible unfitness of elderly patients to withstand prolonged general anaesthesia needed for complex surgical procedures. The surgical techniques advocated in this presentation are relatively simple procedures. In addition, surgery allows one to obtain histological confirmation not only of the diagnosis, but also of the adequacy of excision. Unlike radiotherapy, surgery does not produce serious and irreversible complications in the adjoining tissues which were originally uninvolved in the neoplastic process.

Lederman (1976) reports an overall rate of 13.6% of serious complications like lid necrosis, keratinisation of conjunctiva, corneal ulceration, radiation cataracts, and loss of eyes following radiotherapy. This is in addition to telangiectasia 12%; lid deformity 7%; epiphora 10%; and recurrence of about 10%. But Lederman's series was of a large sample of 896 patients of whom 90 patients were 'seen but not treated'. Rank (1973), in comparing the relative cost of surgery and radiotherapy for skin cancers, has shown that outpatient surgery under local anaesthesia is cheaper than radiotherapy.

The recurrence rate of 0.87% in this series compares well with results reported by other surgeons—Milverton (1977), 1.2%; Collin (1976), 2.3%; Holmström *et al.* (1975), 9%. Older *et al.* (1975) attribute their 100% cure rate to the frozen-section control they exercised in 72% of their cases. In the

present series, with the recurrence rate of 0.87%, frozen section was utilised in 1 case only. It would appear that routine frozen-section control may need to remain an ideal unattainable for most surgeons in the United Kingdom at present owing to practical considerations.

Conclusion

This study shows that primary surgery can effectively deal with most palpebral cancers irrespective of the size and location of the tumour. Most of the surgical techniques described here are relatively simple one-stage procedures, capable of being performed under local anaesthesia on day-case basis, making surgery the initial treatment of choice for such tumours.

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